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Elfric D. INGALL
Ottawa, Ont.

REPORT

ON

THE PROPERTY

OF THE

ST. ONGE GOLD MINING COMPANY.

BY

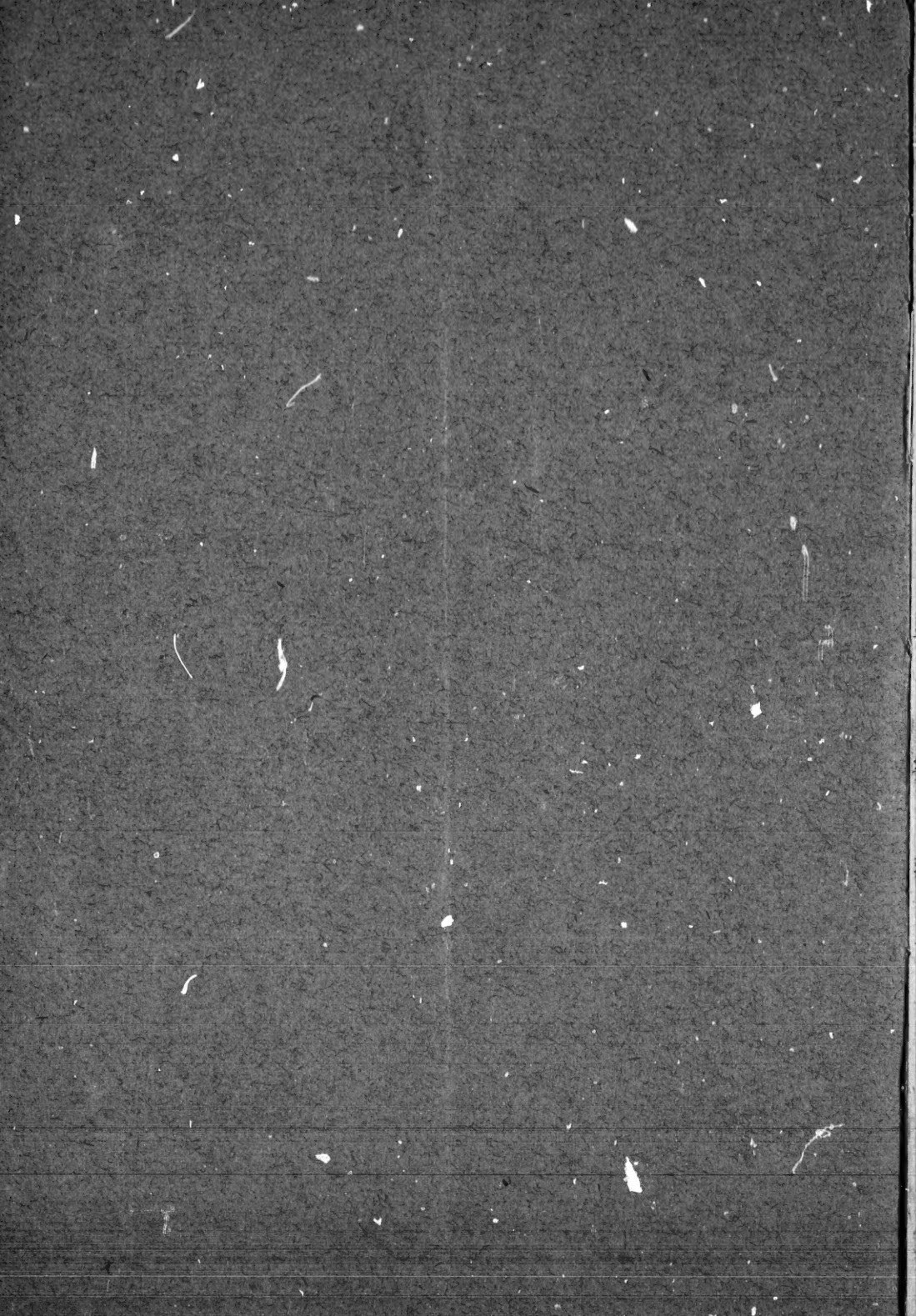
PROFESSOR E. J. CHAPMAN, PH.D.

ADDRESSED TO

W. A. ALLAN, Esq., OTTAWA.

JUNE, 1886.

TROUT & TODD, PRINTERS, 66 & 68 CHURCH ST., TORONTO.

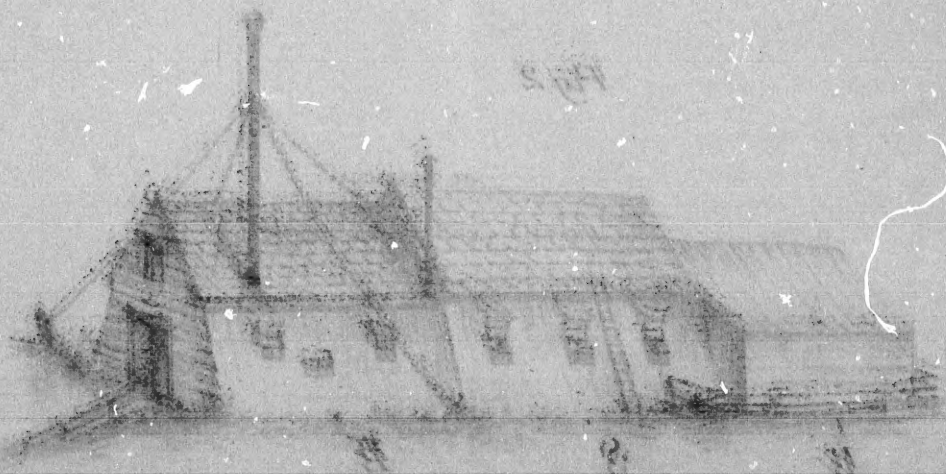


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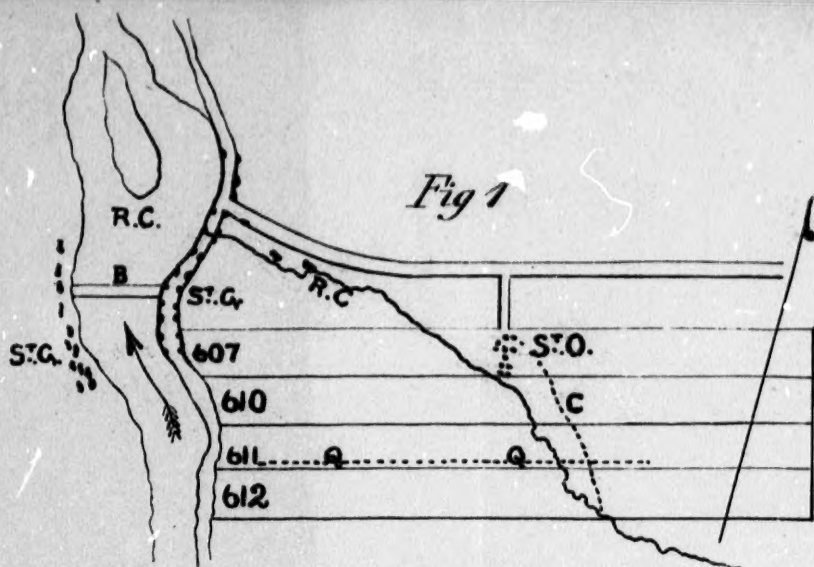
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EXPLANATION:- R.C. *River Chaudière.*

St.G. *Village of St George, on both banks of the Chaudière.*

B. *Bridge.*

R. A. *Ruisseau de l'Ardoise.*

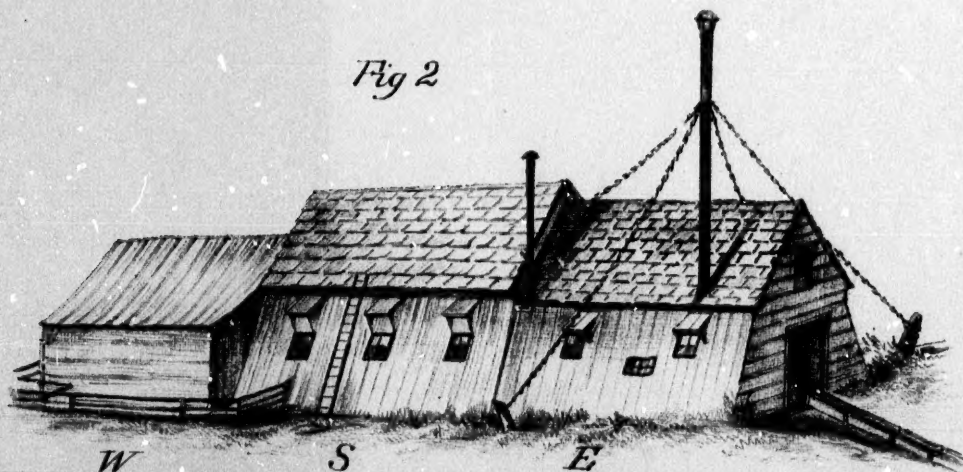
607:612. *Property of the St Onge Gold Mining Company.*

St.O. *Site of the St Onge Gold Mine.*

C. *Canal, Carrying Water to sluices*

Q. Q *Quartz vein.*

Fig 2



Explanation.

E. *Engine House.*

S. *Shaft House.*

W. *Whim Shed.*

} See Sect 3

Elfric D. INGALL
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Report on the St. Onge Gold Mine.

TO WILLIAM A. ALLAN, ESQ., ETC., ETC., OTTAWA:

SIR,—Having received your instructions to furnish you with an impartial report on the present condition and prospects of the St. Onge Gold Mine in the County of Beauce, Quebec, I proceeded to the spot and passed three complete days and part of another day on the ground. On the first and again on the third day I went below and examined carefully the underground workings, and during the intervening time I made a thorough inspection of the surface works and general surface character of the entire property. A summary of this examination, with resulting deductions, is embodied in the following Report:

1. Site, and General Description of the Property.—

The property of the St. Onge Gold Mining Company is situated in the Parish of St. George, Beauce County, Province of Quebec. The village of St. George lies along both banks of the Chaudiere River, and the property of the Company extends from the right bank of this river in a general E.N.E. direction, as shewn in the sketch-map, (Fig. 1.) The present working shaft is about one mile from the village, and is connected with the latter by a good road. In this village there are excellent stores from which all necessary supplies can be obtained. There is thus no necessity for boarding houses or store houses on the mining ground, and plenty of skilled mining labor can be obtained at low rates in the immediate vicinity. The distance of the village of St. George from the city of Quebec is 60 miles. Fifty miles of this distance are traversed by the Quebec Central Railway, which now extends to St. Francis, 10 miles from St. George, and which will reach the latter village within, it is thought, the present year. Several miles between the two villages are already graded.

The actual property of the Company comprises four contiguous lots, 607, 610, 611, and 612. These contain, altogether, 350 arpents. They are traversed (see sketch-map, Fig. 1) by a rocky and rapidly descending stream, known as La Ruisseau de l'Ardoise or Slate River, which flows in a succession of rapids from the upper part of the property and falls into the Chaudiere at the village of St. George. From this stream an unfailing supply of water is readily obtained for sluicing and other purposes, as described under Section 4, below. The mining

rights of the property are held by the Company in fee simple. The right of uninterrupted possession is thus absolutely secure.

2. Geological Features and "Gold Leads" of the District.—The country rock of this district consists of black slates of the Levis Formation. These, on the St. Onge property, dip at a considerable angle (50° to 60° , in places higher) towards the N.W., and shew a very uniform strike, N. 20-30 E., across the entire location. At numerous spots, veins or bands of quartz, varying from mere strings to 3 or 4 feet in width, run parallel with the strike of the slates. One of these quartz veins, shewing an average width of at least 3 feet, runs through the entire length of lot 611. I took some small pieces from an opening in this vein, 10 feet below the surface, close to where it crosses the Ruisseau de l'Ardoise, and I obtained another small sample from a second opening on the same vein about three-fourths of a mile south-west of the stream. A fire-assay of the first sample yielded 3 dwts., 12 grs. gold, and one of the second not quite 2 dwts. per ton. It will of course be understood, that, beyond shewing the actual presence of gold in the vein, assays of small samples of this kind are of little practical value—more especially as the quartz veins of the Chaudiere valley, generally, have been shewn by trustworthy assays to vary greatly in richness within very short distances. Samples from one and the same vein have thus been found to vary from nothing or mere traces, to 8 or 10 pennyweights (and in some cases to several ounces) per ton. No reliable estimate of the amount of gold carried by the vein on lot 611 can be arrived at without actually milling some ten or twenty tons of the quartz taken from different parts of the vein. If a test of this kind shewed good results, the vein, it may be stated, could be worked very readily and economically.

In many places, the slate rock, here called "bed-rock," is exposed on the surface of the ground, but in most places it is covered by a deposit of alluvial earth, clay, boulder-clay, black magnetic sand, and coarse gravel, varying from a few feet to over 150 feet in thickness. There is hardly a single stream in the Chaudiere country that does not carry more or less gold, chiefly in the gravel which fills the cracks and crevices, and behind the harder projecting portions, of the rock which forms its bed. But the greater part of this surface gold has long since been extracted, at least as regards the smaller streams and rivers where the bed-rock can easily be got at and explored. It has now been ascertained, however that in very many cases, and by legitimate inference probably in all cases, ancient representatives of these existing streams and rivers flowed at one time in older and lower channels, occupying the same valleys

and running in the same general direction as the present streams. These ancient and, as a rule, wider channels have been subsequently covered up and hidden by deposits of glacial and post-glacial age, consisting, as already stated, of gravels and black magnetic-sand, clays and boulder-clays, other gravels (in places auriferous), and vegetable soil. The clays and boulder-clays contain apparently no trace of gold; and it is only in the lowest layer of gravel immediately above the bed-rock, and in the cracks and hollows of the bed-rock itself, that gold occurs in paying quantity. All underground explorations, therefore, have to be carried down to the bed-rock. When the gold is washed, a certain amount of black magnetic sand is almost always found with it in the sluices, but this arises from the comparative density of the sand. The black sand itself is no absolute indication of the presence of gold, as it occurs almost everywhere in the detritus of our crystalline rocks.

3. The St. Onge Mine. Surface Works, Shaft, and Underground Explorations.—The shaft and present workings of the St. Onge mine are situated near the northern limit of lot 607. A short piece of road connects this lot with the parish road leading to St George, the distance between the mine and the village being about one mile.

The main buildings at the mine consist of three solid frame structures, opening into each other, and comprising the engine house, shaft-house, and whim-shed (see figure 2). The total length of these buildings slightly exceeds 120 feet. At the mouth of the shaft a line of well-constructed sluices extends southwards to the stream which traverses the entire mining location, as shewn on the sketch-map, figure 1. From a high point on this stream, near the southern boundary of lot 612, a canal, 2,640 feet in length, carries an abundant supply of water to the head of the sluice in the shaft house, and the water, after passing through the entire line of sluices, empties itself into a lower part of the stream. The washing of the pay-dirt, dumped from the shaft mouth into the sluice, is thus very efficiently performed. Nearly all the gold is caught in the higher sluice-boxes; but to guard against any chance of loss, an iron "tom" or perforated plate is let into one of the lower boxes, and the fine stuff which passes through the apertures of the "tom" falls into an under-sluice. The sluicing does its work very perfectly, and the superintendent in charge of the mine, MR. A. A. HUMPHREY, kept the work going all last winter by fitting the sluice boxes with covers, and occasionally turning into the sluice a jet of steam.

The shaft, 9 feet by 5 feet, is 160 feet in depth, the bed rock being somewhat deeper under this part of the location

than in most other places where shafts have been sunk in the district. The shaft is divided throughout its entire depth into two compartments, and is very solidly timbered. The pumping gear runs down the corner of one compartment. A horse-whim, with drum of eight-feet diameter and three-quarter inch steel wire rope, constitutes the lifting power. One kibble or bucket is of course ascending as the other goes down, and the work goes on very smoothly and regularly. There are no ladders to the shaft.

The pumping is effected by a Knowles' vertical pump, which does the work very efficiently; but the shaft is also provided with an additional Cornish pump for reserve use. See Mining Plant, under Section 4. The present underground drifts are to be regarded merely as trial or prospecting drifts, but all are well and solidly timbered. They run for the greater part through boulder clay above, and coarse gravel below, the bed-rock forming their sole or floor; and their excavation is mostly pick and shovel work. At one point, however, not far from the shaft, the bed-rock was found to rise in the form of a hard ledge or boss, and this had to be traversed by blasting. Still farther on, in the same direction, another hard and high ledge of slate has been encountered, and after penetrating this in one drift to about 45 feet the drifting has been stopped for a time in that direction, and other drifts are being run in the hope of getting round the obstruction. It is very probable that on the other side of this ledge rich pay-stuff will be found. The rise cannot continue much farther, as otherwise the rock would soon be brought up to near the level of the ground, and there are no surface indications of this. Nor was any rock met with in an old shaft, sunk in this direction to a depth, I am told, of about one hundred feet, and abandoned at that time (*i.e.* before the property came into the possession of the present holders) from want of sufficient pumping power to keep out the water. One of these drifts has a length of 340 feet from the shaft, but the air is remarkably good throughout, thanks to an ingenious contrivance of Mr. Humphrey's, the able superintendent of the mine.

An examination of these drifts points clearly to three conclusions: first, that the drifts run evidently along (or in some cases partly across) an old river-bed, as shewn by the worn surface of the rock in many places, the presence of large boulders, often wedged into crevices in the rock, and the constant presence of coarse and fine gold, partly in the form of rounded or slightly flattened pieces the size of small beans or peas, and partly in minute scales—every washing shewing more or less of these. Secondly, it is evident that the shaft has been put down

not in the centre of the old stream but near one of its banks ; and thirdly, there can be no doubt that the stream at this place formed a series of shoots or rapids. It is therefore somewhat remarkable that any gold beyond occasional nuggets should have been found here. The force of the stream must necessarily have swept before it the greater part of the gold. It may therefore be fairly anticipated that when these rapids or broken portions of the stream are passed, the yield in gold will be greatly increased. Even at present, there has been a marked increase in the drifts which proceed "up stream."

4. Buildings and Mining Plant.—The buildings on the property of the company comprise :—the engine-house, shaft-house, and whim-shed, already referred to. (See figure 2.) Also, a large office, a blacksmith's shop and store-house, and a laborer's cottage. A small house for the foreman has also been put up just outside the property.

The plant includes the following :—Waterous boiler (25 h.p.) ; locomotive boiler (18 h.p.) ; upright boiler (not in use at present) ; steam winch ; Brush engine (20 h.p.) ; Learmont feed pump ; Korting injector ; Knowles pump ; Cornish pump ; complete hoisting gear, drum, buckets, &c., with three-quarter inch steel-wire rope ; sluice boxes from shaft to stream with complete fittings ; picks, shovels, barrows, &c., for 20 men ; furnishings of blacksmith's shop ; 1,000 cords of firewood = (\$1,600) ; 200 saw logs, at 45 cents each ; 3,000 saw logs, at 12½ cents each ; 75 pieces of long framing timber, at \$1.25 each ; 350 "laths" or heavy slabs, at 12 cents each. All the machinery is in first-rate order.

5. More pressing requirements.—In order to work the mine efficiently, a stronger force of men should be put upon it. This would necessitate the sinking of another shaft in the upward direction of the old river-course. If this shaft were put down, not only could more men be employed, but the present working shaft might be retained merely for hoisting and pumping purposes. The pump has now to be kept running day and night. With a second shaft, the night pumping might be avoided: engineers' wages, wear and tear of engines, fuel, etc., would be thus lessened. Pumping on alternate days even, would probably be sufficient to keep the working levels free from water. A small boring apparatus, like that used in the oil districts, would also be very serviceable in testing the ground for depth of bed-rock, presence of underground ledges, and so forth. I think it would soon repay itself. I would also suggest that a small saw-mill would be very advantageous. It could be run by one of the engines now in use, and would soon repay its cost.

6. General conclusions.—During a somewhat long experience in the examination of mining properties, I have not yet seen any mine more favourably situated than the St. Onge mine. It lies in a settled district, within little more than a mile of a large village in which all necessary supplies can be obtained ; and it is in the midst of an abundant supply of cheap labour, not unskilled for the greater part in mining operations. It is moreover in the immediate vicinity of a line of railway, the Quebec Central. In its present condition, also, the mine is well equipped with working gear, and is in thorough working order. Furthermore, the presence and permanency of gold in the mine is fully proved. On that point there can be no question. The only question, the real question on which the future of the mine depends, is simply this : are the present indications sufficient to warrant the inference that the gold will be found to increase in quantity as the work proceeds ? At present, every cleaning up shews no inconsiderable amount of gold. During my stay at the mine, $1\frac{1}{4}$ oz., $2\frac{1}{4}$ oz., and 1 oz., (in all $4\frac{1}{2}$ ounces) were taken out of three small portions of ground. It is not pretended, however, that the present yield is sufficient to cover the mining outlay. But it is assumed, and I think with good reason, that the drifts are at present in what is probably, if not necessarily, the poorest part of the mine ; and that when less rough and broken ground is reached, a large increase may be legitimately expected. This of course, cannot be guaranteed ; but the weight of evidence is undoubtedly in its favour. The workings at the celebrated Gilbert mines, a few miles north-east of the Company's property, were in many places far less favourable than those of the St. Onge mine, whilst, in other places, suddenly and unexpectedly, pay-stuff amounting in value to thousands of dollars was taken out in the course of a few days.

With this experience before us, and with the mine thus efficiently equipped and started, only one opinion can be expressed, namely : that the work should be pushed forward, unflaggingly, until a more thorough exploration is effected. The St. Onge mine is unquestionably of high promise. The property, therefore, fully warrants a more extended development.

I am, Sir,

Your obedient servant,

E. J. CHAPMAN, PH. D.,

*Professor in University College
and School of Practical Science, Toronto,
and Consulting Mining Engineer.*

TORONTO, June 9th, 1886.

